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Report on the
VANDERBURG MINE

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REPORT

ON THE

VAN DERBURG MINE.

BY

JAMES T. HODGE.

NEW-YORK:

GEORGE F. NESBITT AND CO., PRINTERS, CORNER OF WALL AND WATER STREETS.

1858.

1850

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REPORT

OF THE

VANDERBURG MINING COMPANY.

REPORT OF THE VANDERBURG MINING COMPANY, FORMED UNDER THE
 GENERAL LAW OF THE STATE OF NEW-YORK, REGULATING MINING
 COMPANIES, &c. PASSED FEBRUARY 17, 1848, WITH AMENDMENT OF
 JUNE 8TH, 1853.

THE property of the Vanderburg Mining Company is situated in the County of Cabarras, State of North Carolina, adjoining what is known as the Phoenix Mine, distant twenty-two miles from Charlotte, the terminus of the Charlotte and Columbia Railroad, and seven miles from Concord; and consists of the following-named parcels or estates.

The Vanderburg Mine, containing.....	250	acres.
“ Barhart Mine and Estate, containing....	156	“
“ Plunkett “ “	90	“
“ Hagler “ “	80	“
“ Barnhart Mine and Estate “	50	“
<hr style="width: 10%; margin-left: auto;"/>		
Total acres.....	626	

P 76073

Being a tract, in the aggregate, equal to one square mile ; these several parcels lying adjoining, and on the north, south, east, and west of the lands embraced in the property of the Phoenix Mining Company, as will be seen by the accompanying plan, made from actual survey ; a copy of which is in the office of the Company, No. 35 Wall Street, Room No. 10.

R E P O R T .

To the President and Directors of the Vanderburg Mining Company.

GENTLEMEN :

I have, the last month, made a survey of the property belonging to the Vanderburg Mining Company in North Carolina, and herewith send you a map I have prepared of the same, on which the principal veins and important features of the property will be found plotted.

The main track comprises several estates, now consolidated into one : it has an extreme length north and south of about one mile and 100 rods, and east and west is nowhere less than 200 rods. It bounds the property of the Phoenix Mining Company on the north and east, and it must have upon it the extension of all the veins worked by this company.

It is about six miles from Concord, in Cabarras county, to which place the North Carolina Railroad will be in operation next spring.

The surface of the country is elevated ; it is moderately hilly, fertile and well watered. The principal tract is about equally divided between farming and timber land. The growth is mostly oak, with growths of small pines. Many of the large yellow pines are intermixed with the hard-wood growth.

The rock formation is greenstone, seldom seen out-cropping, but exposed in loose pieces over the surface, and reached below by mining operations. It passes into a highly ferruginous

hornblende rock, with which is associated a little serpentine and epidote. The slate belt of this region lies further east; the granite belt is on the west, extending beyond Concord.

A great number of metalliferous veins traverse the greenstone, pursuing a general course north fifty degrees, to north sixty-five degrees east. They consist of quartz, with which are associated sulphate of barytes, spathic iron, and pyritiferous iron and copper. Gold has been found disseminated so abundantly through the vein stones, that explorations upon them have been extensively carried on at times when mining operations were little in favor, capital not abundant, and when the ores were necessarily transported several miles to the nearest mill.

The vein which has been most worked, is traced across a considerable portion of the Phoenix tract, and the whole of the Vanderburg, by a succession of pits sunk along its line of outcrop. On both tracts the mining upon it is prosecuted to a depth requiring steam power for the extraction of the water and ores. It has yielded rich bunches of gold ore near the surface; and throughout the vein gold is diffused in such quantity, that the heaps of ore now lying upon the surface, are valued at not less than \$2 per bushel by the former proprietors of the Vanderburg mine. Many of the specimens extracted, present a beautiful show of coarse gold, such as are not often found at the best mines in the State. As in depth the vein is more pyritiferous than near the surface, it is not unlikely the production may continue to greater depths than is usual at mines deficient in the yellow sulphuret of iron and copper. At Gold Hill, in the same vicinity, gold is abundant in the pyritiferous ores to the greatest depth yet reached, which is 340 feet. The deepest workings on the Vanderburg are only 100 feet. Pyritous copper ore is found in such quantity that the mine may fairly be regarded as a copper mine, and when further

opened by lower levels than the present workings, may reasonably be expected to produce largely of this ore. From my survey of the mine, sections of which accompany the map, it will be seen that the whole extent of the underground workings is only 176 feet, horizontally, and but a small portion of this is at the depth of the bottom of the shafts; with so great a length of vein, the workings can be regarded as little more than superficial. The thickness of the vein varies from three and a half feet down to a few inches. It is more regular than the veins in Guilford county. It is remarkable for its smooth walls and the "comb" like character of its vein-stones. This feature, and the occurrence of the materials making the vein in parallel layers, which is also noticed here, are regarded by miners as very favorable signs of a good vein; of itself, this vein is sufficient to justify the establishment of mining operations on a liberal scale, without reference to the other veins, some of which I now proceed to notice.

The next vein towards the south-east is eighteen rods distant, and pursues a course nearly parallel with the first, so far as it is exposed by the pits opened upon it. The material thrown out appears well as gold ore, and is encouraging for further exploration. The ground is favorably situated for opening the mine to advantage; as it can be proved for this season at little expense, it will be advisable to do this as soon as a mill is in operation for grinding the ores.

The third vein in this direction is called the "*Orchard Vein*;" having received this name on the Phoenix tract, from which it passes into the Vanderburg. It is on the latter, about eighty-three rods south-east of the second vein just described. On the Phoenix, its course is about north 64° east; approaching Plum River, it curves more to the eastward, and its line of outcrop is very crooked. This is in part owing to the unevenness of the surface, which, in connection with an underlay or dip to

the north-west, somewhat flat on the surface, would give greater irregularity of outline to the out-crop of a vein, than belongs to its true course. Many pits have been sunk along this vein on the Vanderburg; a shaft, also, from which a large amount of material has been taken out, as is evident from the size of the waste heap remaining; and a short adit has been driven into the hill on the south-west side of the track. On the Phoenix two shafts have been sunk upon the same vein, and a whim is now in operation working it. My only means of forming an opinion of this vein, were the general reputation it has; the extent of the former operations, which corroborate its favorable reputation; and the appearance of the stuff remaining upon the surface. The rock forming the country, is greenstone with serpentine intermixed. The production of gold, I learn from good authority, was considerable, though the ore was of variable character. Pyritous copper was met with in such quantity, both upon the Phoenix and Vanderburg, that one would be well warranted in sinking deep shafts, in expectation of finding this ore in abundance. In very superficial pits, at the workings farthest to the north-east, near the spring and large poplar noted upon the map, the indications of good copper are very favorable, and here would be a convenient point for sinking upon the vein, and taking off the surface water by a short adit. Were a new company to be organized for working a portion of the mines of this tract, Plum Run would make a convenient division, and leave sufficient territory to the south-east of it.

To the north-east of the first vein described, another vein of importance is found, about fifty-seven rods distant. It has been worked on the lands of Julius Vanderburg, adjoining the Company's tract on the north-east, by surface digging, and by a shaft forty feet deep. It is said to have produced good gold ore. On the other side the property bordering the Phoenix Company's tract, the same vein (probably) outcrops on a little

brook, called Monkey Branch. Both gold and copper ores are here found loose in the banks of the stream ; and notwithstanding the prohibition of the former proprietor, the place has been with some a favorite resort after freshets for collecting little "nuggets" of gold. All applications for right to wash the deposits have been steadily refused. From the information I gathered from one who has been accustomed to the business of gold washing in this region, I am of opinion the vein along this part of Monkey Branch will be found a very valuable one ; and the copper ore met with in the stream, which I found myself, are strong evidence of a workable vein of this metal.

"Branch mining," or working the deposits of the streams, has been prosecuted to considerable extent in this region. A little run just over the boundary, in the farm of Julius Vanderburg, which crosses the continuation of the above described vein, as also that of the vein now worked by the Company, has afforded a considerable amount of coarse gold.

This fact, together with that of the veins, which must have furnished this deposit gold, being actually opened, and presenting highly encouraging features, ought to inspire strong confidence, and lead to the laying out of mining operations on a scale commensurate with the extent and promise of the property. With a mill upon the spot for grinding the gold ores, the expense of transporting these, which is always a heavy item, is saved, and according to the extent of the mill, its capability of grinding up the poorer ores to profit in larger quantities is increased, while the general expenses are reduced in proportion to the product. All mines furnish a much larger proportion of poor than rich ores. It is only those which are extensively worked, and provided with abundant machinery, that can make the great bulk of their products profitable. The difference in the returns must be very con-

siderable, when only the ores yielding one dollar or more per bushel can be made to pay the expenses of preparation, and when those yielding twenty-five cents can be worked to profit, as is the case at some of the gold mines in Virginia. Few companies have so large a field for their operations, and one containing so many veins known to be productive, as the Vanderburg Company.

Along the north-western boundary of the tract, are pits sunk upon another vein. This may be a continuation of the "Faggott Vein," which between these pits and the Hagler Lot, (belonging to the Company,) has been worked quite extensively. Several shafts were sunk upon this vein, besides an almost continuous line of pits, up to the boundary of the Hagler Lot, which the vein enters upon its northern line. Running in a direction about south, thirty-four degrees west, its course is obliquely across the longest dimensions of this lot; separated from the nearest point of the main tract by only fifteen rods, this Hagler Lot, of about eighty acres, may be worked either under the same or a distinct organization.

The out-crop of still other veins is marked by loose pieces of quartz and other vein-stones, near the eastern boundary of the main tract. These probably connect with the first and second veins described. Their position is noted on the map, and no work having been done upon them, a particular description cannot be given.

Beside the Hagler Lot is another tract of about forty-six acres, lying near the main body of the property of the Company, on the northern side of the farms of Julius Vanderburg and Tice Reinhardt. The nearest point of approach is forty-five rods north, sixty-two degrees thirty minutes east of the extreme northern corner; stretching thence to the eastward, the lot takes the continuation of the veins, which pass through the centre of the main tract, or through the farm of J. Van-

derburg. Several have been opened, and the extent of the pits upon no less than three of these veins indicate that here, too, they must have been productive in gold. Although this tract may not be at once required for the operations of the Company, it cannot but be regarded as an important accession to their resources.

The "Plunkett" tract is a fourth lot, about two miles distant to the south-east, on a stream called Rock River. This contains about ninety acres, and, I am informed, has upon it veins of a similar character to the others in this region. My time was too limited to give this the same examination as the rest of the property.

With such resources—abundant territory, well located and containing numerous veins, all producing gold, and some copper ores also—the gold in many of the veins having, heretofore, under disadvantageous circumstances, extracted to profit, and the copper ores having every appearance of increasing in quantity and value as the mines are worked deeper—the property of the Vanderburg Mining Company is likely to repay generously the capital and enterprise expended in its thorough development.

Respectfully, I am,

Yours, &c.,

JAMES T. HODGE.

December 22, 1853.

REMARKS

ON THE

GOLD DIGGINGS IN THE VANDERBURG MINE

OF

NORTH CAROLINA.



A recent mining tour made with the President of the Company, allowed me to view the mines and mining operations carried on at present, with great energy, in the county of Cabarras, State of North Carolina. The most positive arguments of the existence of immense quantities of precious metal, have already been laid before the public, and even a superficial examination of the mines and minerals, must convince the eye of a mineralogist, that the report lately published by the President of the Vanderburg, does not exaggerate in the least the wealth that can be obtained from this mine. That the gold is there, needs no further argument, and immense quantities of it will be gained, if in time a judicious arrangement should be introduced, founded on practical science, and aided by the necessary funds and practical men. At present it is considered

sufficient to extract only the sands and earthy rocks ; and this is done in a way by which only a comparatively small quantity of the gold existing therein can be got. No regard is taken of that great, and in many cases predominating quality, that will not yield to the simple processes of washing and amalgamation.

The occurrence of gold in this mine is widely different from that in the diggings of California, and the processes sufficient to extract the gold of the California sands and quartz, are insufficient for the extraction of the greatest part of the auriferous ores.

It is easy to the practical metallurgist to show that a very great quantity of gold necessarily escapes in the rough processes of working which are now in use, and that by other processes, and better constructed apparatus, adapted to these ores, far greater profits could be obtained, without raising the expenses in the same ratio.

The rocks through which the veins run in the Vanderburg mine, are talcose slate, as the hanging wall ; greenstone slate as the foot wall, often with sharp separation of the veins from the rock, almost throughout the whole mass of the rocks. Iron pyrites are disseminated in small brass-yellow crystals aggregating in greater number where quartz veins occur, and at the borders of the metallic veins.

The ores of the veins are generally copper pyrites, (sulphuret of copper and iron, kupferkies,) intimately mixed with iron pyrites and copper glance, of the most beautiful peacock colors, and frequently in well-formed crystals. Some specimens show the valuable red copper ore, but only in small quantities. I obtained specimens of brown sparry and clayey iron ore, (Carbonate of copper, grünkupfererz,) as well as malachite in druses and nests.

Iron occurs as pyrites in masses and single crystals, as carbonate and aluminite. The latter show very frequently a

great degree of decomposition, great friability, a cellular, sometimes lava-like, structure, with nests of fine crystallized quartz and other minerals. Some specimens which contain iron oxides and felspar together, illustrate a matter of the highest mineralogical interest; the iron oxides are in the shape of very thin lamellæ, inclosing an empty rhombic cell of exactly the same angles as the crystalline fissures of the grayish spar, which latter shows a very advanced state of decomposition. The simplest explanation of this very interesting fact is, that the iron oxide in solution filtered into the crystalline fissures of the spar, and combining with its constituents, formed these lamellæ, completing at the same time its decomposition.

Wherever the iron oxides occur in that friable porous state, lining the holes of quartz or pyrites, (what the miners call honey-combs,) they are highly auriferous, and yield a great quantity to simple washing and amalgamating process.

Another form in which the iron occurs, is a black, heavy powder, disseminated through the iron ores and auriferous sands; it is magnetic iron, and occurs so generally along with the gold, that the diggers of the Ural, in Russia, Bohemia, Austria and other countries, consider it an indicator of the gold itself.

The quartz of the mine show very frequently beautiful particles of gold, mostly in fissures colored by ferruginous infiltrations, and near the junction with the adjacent rocks, seldom in the middle of the silicious mass.

Wherever the quartz occurs in a cleft, rugged and broken state, intermixed and lined with earthy iron oxides, (honey-combs,) there the richest harvest of gold can be expected.

The gold itself, disseminated through all the rocks of a wide district, is for the greatest part invisible, and held in close combinations with the pyrites of iron and copper, and is found in immense quantities at this locality. It is among the gold miners of Europe long ago well-understood, that even the

richest of the auriferous pyrites yield only a comparatively small quantity of their gold to direct amalgamation. Other processes are needed to develop the golden treasures from the pyrites, and these processes are neither complicated nor expensive compared with their certain results.

The pyrites of the Vanderburg mine are richer in gold than any washed in Europe, and as matters now stand, it can reasonably be predicted, that by a more scientific and judicious management, and only by that, the Vanderburg mine, of Cabarras county, will prove one of the best and most profitable enterprises on which capital may be invested.

C. LUDWIG RICHTER,

Practical Metallurgist,

From Berlin.

October 30, 1853.

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